IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. An ultrasound transducer probe, comprising: an attenuation backing substrate; an integrated circuit coupled to the attenuation backing substrate, wherein the integrated circuit is translucent to acoustic waves; and an array of piezoelectric elements coupled to the integrated circuit; the array of piezoelectric elements having an acoustic matching layer disposed on a first surface of the array thereof, wherein the thickness of the integrated circuit is less than 50 μm.

2. The ultrasound transducer probe of claim 1, wherein the attenuation backing substrate includes a material capable of providing an attenuation on the order of approximately 10 dB/cm at 5 MHz to 50 dB/cm at 5 MHz.

3. The ultrasound transducer probe of claim 1, wherein the attenuation backing substrate includes epoxy composite materials that consist of epoxy and a mixture of very high and very low acoustic impedance particles.

4. The ultrasound transducer probe of claim 1, wherein the integrated circuit includes a thickness sufficiently small for causing the integrated circuit to be translucent to acoustic waves.

5. The ultrasound transducer probe of claim 1, wherein the thickness of the integrated circuit is ~~on~~

~~the order of approximately 5-50 μm~~5 μm or more.

6. The ultrasound transducer probe of claim 1, wherein the integrated circuit includes at least one of a silicon based, a gallium based, and a germanium based integrated circuit.

7. The ultrasound transducer probe of claim 1, wherein the array of piezoelectric elements includes a two-dimensional array.

8. The ultrasound transducer probe of claim 1, wherein the array of piezoelectric elements includes a one-dimensional array.

9. An ultrasound transducer probe, comprising: an attenuation backing substrate, wherein the attenuation backing substrate includes a material capable of providing an attenuation on the order of approximately 10 dB/cm at 5 MHz to 50 dB/cm at 5 Mhz; an integrated circuit coupled to the attenuation backing substrate, wherein the integrated circuit is translucent to acoustic waves, wherein the integrated circuit includes a thickness ~~on the order of approximately 5-50 μm~~ of from 5 μm to less than 50 μm and is sufficient for causing the integrated circuit to be translucent to acoustic waves; and an array of piezoelectric elements coupled to the integrated circuit; the array of piezoelectric elements having an acoustic matching layer disposed on a first surface of the array thereof.

10. The ultrasound transducer probe of claim 9, wherein the attenuation backing substrate includes

an epoxy composite material that consists of an epoxy and a mixture of very high and very low acoustic impedance particles, and wherein the integrated circuit includes a silicon based integrated circuit.

11. An ultrasound diagnostic imaging system utilizing an ultrasound transducer probe, the transducer probe comprising: an attenuation backing substrate, wherein the attenuation backing substrate includes a material capable of providing an attenuation on the order of approximately 10 dB/cm at 5 MHz to 50 dB/cm at 5 MHz; an integrated circuit coupled to the attenuation backing substrate, wherein the integrated circuit is translucent to acoustic waves, wherein the integrated circuit includes a thickness ~~on, the order of approximately 5-50 μm~~ of from 5 μm to less than 50 μm and is sufficient for causing the integrated circuit to be translucent to acoustic waves; and an array of piezoelectric elements coupled to the integrated circuit; the array of piezoelectric elements having an acoustic matching layer disposed on a first surface of the array thereof.

12. A method of fabricating an ultrasound transducer probe, comprising: providing an attenuation backing substrate; coupling an integrated circuit to the attenuation backing substrate having a thickness less than 50 μm, wherein the integrated circuit is translucent to acoustic waves; and coupling an array of piezoelectric elements to the integrated circuit; the array of piezoelectric elements having an acoustic matching layer disposed on a first surface of the array thereof.

13. The method of claim 12, wherein the attenuation backing substrate includes a material capable of providing an attenuation on the order of approximately 10 dB/cm at 5 MHz to 50 dB/cm at 5 MHz.

14. The method of claim 12, wherein the attenuation backing substrate includes an epoxy composite material that consists of epoxy and a mixture of very high and very low acoustic impedance particles.

15. The method of claim 12, wherein the integrated circuit includes a thickness sufficiently small for causing the integrated circuit to be translucent to acoustic waves.

16. The method of claim 12, wherein the thickness of the integrated circuit is ~~on the order of approximately 5-50 μm~~5 μm or more.

17. The method of claim 12, wherein the integrated circuit includes a silicon based integrated circuit.

18. The method of claim 1, wherein the array of piezoelectric elements includes a two-dimensional array.

19. The method of claim 1, wherein the array of piezoelectric elements includes a one-dimensional array.

20. A method of making an ultrasound transducer probe, comprising: providing an attenuation backing substrate, wherein the attenuation backing substrate includes a material capable of providing an attenuation on the order of approximately 10 dB/cm at 5 MHz to 50 dB/cm at 5 MHz; coupling an

integrated circuit to the attenuation backing substrate, wherein the integrated circuit includes a thickness ~~on the order of approximately 5-50 µm~~ of from 5 µm to less than 50 µm and is sufficiently small for causing the integrated circuit to be translucent to acoustic waves; and coupling an array of piezoelectric elements coupled to the integrated circuit; the array of piezoelectric elements having an acoustic matching layer disposed on a first surface of the array thereof.